

# 6 Socio-Economic Well Being

## Socio-Economic Well Being Status and Trends

Socio-economic well being considers both the economic status and quality of life for people, along with the industrial structures that produce forest and rangeland products. The commodity and non-commodity resources produced by forests and rangelands affect socio-economic well being, particularly for residents in rural areas. California's forests and rangelands provide a wide variety of resources that benefit society and ultimately improve well being of all residents. Economically, the most significant goods and services are wood, forage, recreation, and high quality water supply. Other goods and services such as cultural resources, open space, and diverse wildlife habitats are also important but more difficult to quantify.

In addition to addressing the production of goods and services, the broader quality of life, or well being, of individuals, households, and communities associated with California's forests and rangelands must be considered. The well being of the people and communities within forest and rangelands is integral to any comprehensive assessment of these areas. As California's population and economy grow, the character of rural and urban areas will continue to change.

FRAP uses the concept of well being to capture the

themes that are consistently discussed in local coffee shops, real estate offices, assessments of communities, and governmental initiatives to deliver services. Some of the recurring themes are income earning opportunities, the absence of poverty, educational quality, public safety, involvement in local civic and interest groups, and various aspects of a clean and enjoyable environment. The relative importance of such characteristics varies among individuals and communities but they all attract considerable attention.

## Socio-Economic Well Being Indicators

- **Income and Well Being Indices**
- **Regional Job and Wage Growth Trends**
- **Commodity and Non-Commodity Production and Use Trends**
- **Water Quantity and Use**
- **Status of Forest Products Industry**
- **Status of Range Livestock Industry**
- **Status of Forest and Rangeland Energy-Related Industry**
- **Status of Recreation Industries**
- **Timber and Rangeland Contributions to Funding Rural Infrastructure Needs**



Photo courtesy of the National Park Service.

## Socio-Economic Well Being

# Representative Goal

Create and maintain conditions under which man and nature can exist in productive harmony to fulfill the social and economic requirements of present and future generations (*paraphrased from California Public Resources Code 21001 (E), Division 13. Environmental Quality, Chapter 1. Policy*).

# Findings

- Economic status is lower for many forest and rangeland counties compared to statewide averages, but social well being measures are typically above statewide averages.
- Demands for timber products, livestock products, water, and aesthetic values such as open space and recreation continue to rise. Due to continuing increases in consumption and stable to declining outputs of forest products, California is becoming increasingly dependent on wood products imports, primarily from Oregon, other western states, and the southern United States.
- Water supply and use continue to be an ecological and economic theme in California. The intersection of ecological values of water and increasing needs for urban uses will remain a foremost challenge facing California in the future.
- Over the last decade, timber harvesting and sawmill production have declined. Overall production value for timber and paper products and range livestock products have been stable over the last decade.
- Several factors affect the range livestock industry: changes in consumption patterns in beef and sheep products, reliance on imports, and higher costs constraining profits; increasing emphasis to provide and protect a broad array of environmental services; and land development pressures that raise the value of rangeland over its worth for livestock operations.
- Biomass material as a source of statewide power generation has remained steady over the last decade (three percent of total power generation). Substantial unused biomass material is found statewide. Sustainability of nearly one-third of the statewide biomass power plants is in question due to lack of long term contracts.
- Outdoor recreational use of forests and rangelands are steady to increasing. Recreation use near metropolitan areas is a very substantial portion of total use particularly when considering its land base. In terms of visits, the metropolitan wildland parks provide approximately 50 percent of all visits but comprise only 13 percent of total public land available for outdoor recreation.

## Income and Well Being Indices

**On-line Technical Report:**  
[http://frap.cdf.ca.gov/assessment2003/Chapter6\\_Socioeconomic/socio.html](http://frap.cdf.ca.gov/assessment2003/Chapter6_Socioeconomic/socio.html)

**Data Quality: All required data** ●

Many studies have shown that income is a significant, but not the only, influence on overall well being at the household, community or regional scale. Numerous other cultural, historical, and local institutional factors play strong roles in determining overall well being. To evaluate the socio-economic well being of people in bioregions and counties dominated by forests and rangelands, FRAP used thirteen indicators from four non-income related themes of well being to construct a quantitative well being index (Table 37). The four themes are equity, education, safe and involved communities, and environmental quality. Examples of the non-income well being indicators are absence of poverty, educational quality, public safety, involvement in local civic and interest groups, and various aspects of a clean and enjoyable environment. While the relative importance of each individual indicator varies among individuals and communi-

ties, the composite index provides a balanced representation of the breadth of commonly-valued attributes.

Bioregions dominated by forest and rangeland counties (as determined by natural vegetation, population, and economic structure) include Klamath/North Coast, Modoc, Sierra, Sacramento Valley, and Central Coast. These bioregions are similar in that nearly all of them are below the California average in terms of per capita income but considerably above the average in terms of most other components of well being (Figure 73).

Strong positive influences from factors such as local family, community, and business support could be reasons for high composite well being index scores relative to income levels for counties above the California average. The primary challenge for most of the forest and rangeland bioregions appears to be diversifying and expanding their economies while maintaining the relatively high scores in other aspects of well being.

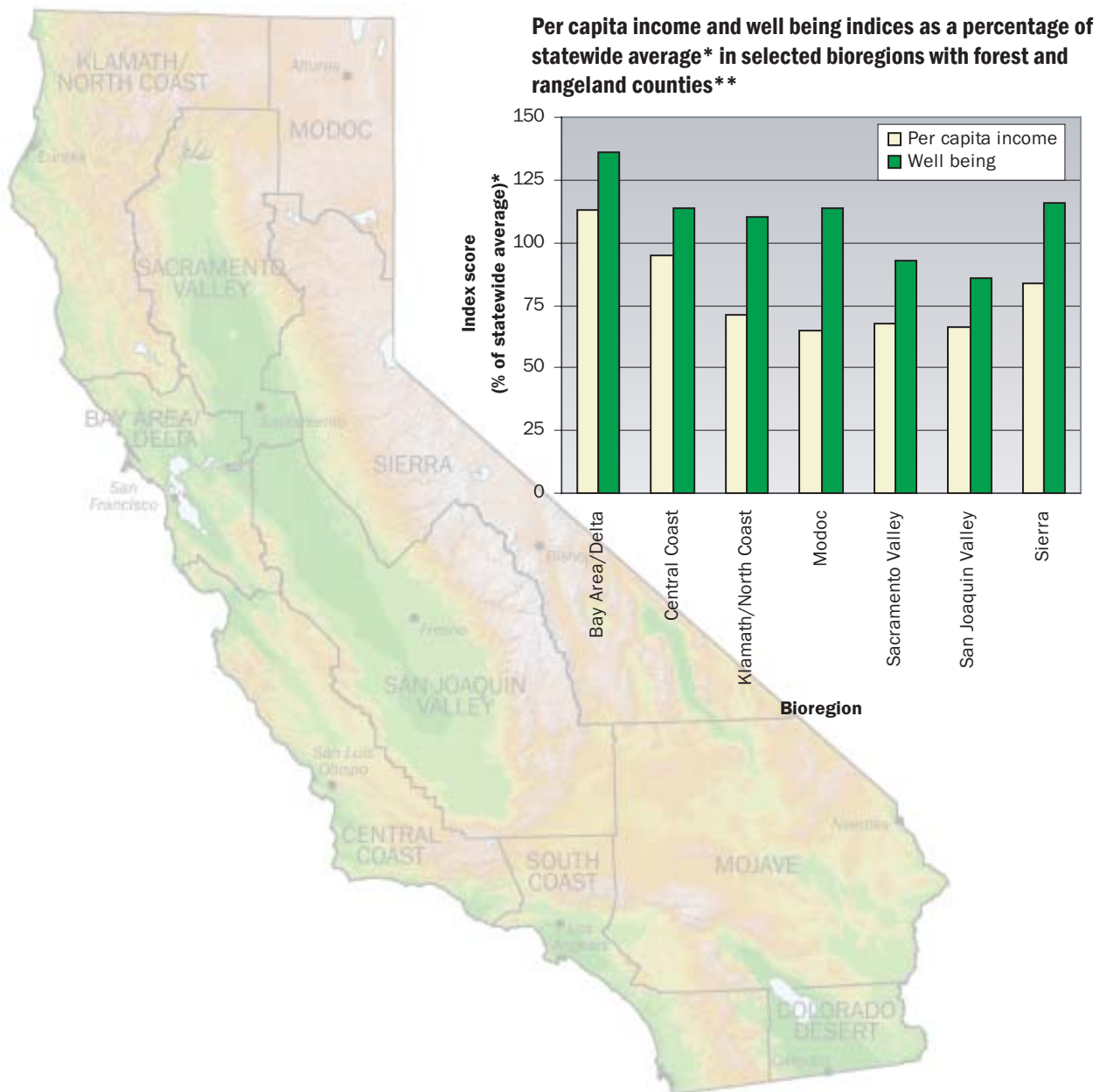
**Table 37. Socio-economic themes and indicators used to create the composite well being index**

Five themes	Indicators in the FRAP composite well being index	Other indicators not in the FRAP composite well being index discussed in companion technical report
Theme 1: Income	Per capita income	
Theme 2: Equity	Poverty rate Food stamp need Home ownership rate	Poverty rate (0-17 age only) Number of bankruptcies Number of new single family homes Number of new multi-family units
Theme 3: Investment in education	Per pupil spending Classroom computers per 100 students Percentage of students with SAT score over 1000	Classrooms with Internet access CD ROMs per 100 students Classrooms with wide area networks
Theme 4: Safe and involved communities	Physicians per 1000 population Voter participation Burglary rate	Violent crime rate Number of active watershed groups Number of active Fire Safe Councils
Theme 5: Environmental Quality of life	Short commute (less than 30 minutes) Natural amenity index Number of high particulate days	Unincorporated population density Air pollution – ozone

Source: FRAP, 2002e

**Figure 73. Regional Socio-Economic Well Being Indicator**

Socio-economic well being includes the economic status and several other measures of quality of life in rural forest and rangeland counties. Most bioregions with forest and rangeland counties have income levels below the California average but rank high on quality of life.



\* 100 percent equals statewide average

\*\* counties with more than 50 percent of area in forest and rangeland land covers, populations less than 250,000 people or no cities greater than 50,000 people, and economic output generated from timber production or grazing activities

Source: FRAP, 2002e

Map: County-based bioregions

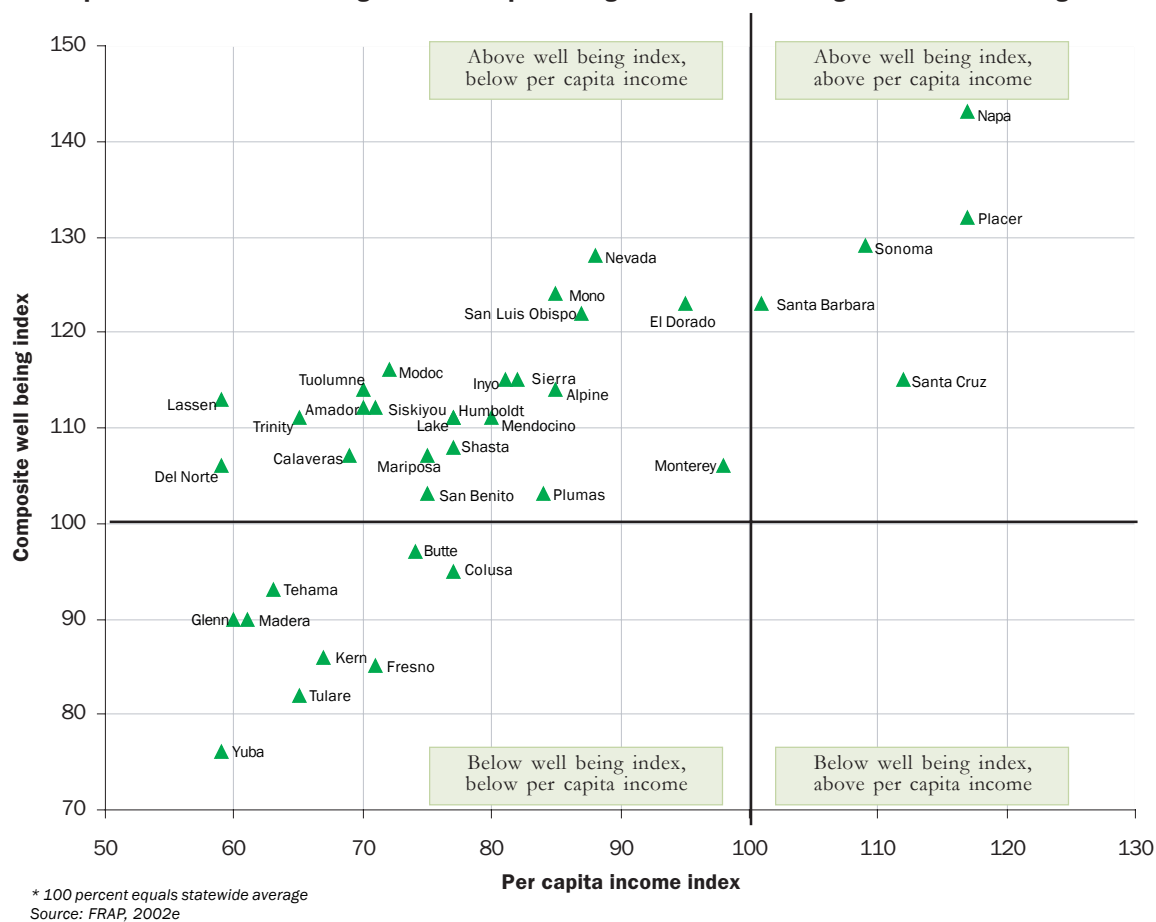


## 6 Socio-Economic Well Being

Figure 74 shows how individual forest and rangeland counties compare to the statewide average in terms of income and well being. The majority of these forest and rangeland counties rank relatively high for well being, but lag in income levels. Several counties—Napa, Sonoma,

Placer, Santa Barbara, and Santa Cruz—rank high in both income and well being. Broad economic bases, nearby urban centers, and natural settings all contribute to their high rankings.

**Figure 74. Per capita income and well being indices as a percentage of statewide average\* in forest and rangeland counties**



## Regional Job and Wage Trends

**On-line Technical Report:**  
[http://frap.cdf.ca.gov/assessment2003/Chapter6\\_Socioeconomic/economicconditions.html](http://frap.cdf.ca.gov/assessment2003/Chapter6_Socioeconomic/economicconditions.html)

**Data Quality:** All required data ●

During the 1990s regional job and wage trends varied considerably. The overall regional measures capture the net result of the increases and declines of various employment sectors. Table 38 summarizes job growth,

unemployment rates and wage growth for the regional economies as defined by California Economic Strategy Panel (CESP) (these generally conform to county-based bioregions). The most populous urban regions—the Bay Area, Southern California, Southern Border (San Diego) and Sacramento—had varying rates of job and wage growth but all had unemployment levels in 2000 below the statewide average. Less urbanized regions, on the other hand, had higher unemployment rates and low or even negative growth in average wages.

**Table 38. Percentage change in job growth, unemployment rate, and growth in average wage by CESP region\***

Region	1990-2000 job growth	2000 unemployment rate	1990-2000 growth in average wage
Bay Area	20	2.7	49
Central Coast	19	6.2	7
Central Sierra	18	6.3	-2
Greater Sacramento	27	4.8	13
Northern California	13	8.0	-1
Northern Sacramento Valley	19	8.3	2
San Joaquin Valley	21	13.9	1
Southern Border	23	4.1	19
Southern California	8	5.0	8
Statewide	16	5.2	19

\* CESP regions generally conform to county-based bioregions.

Source: California Employment Development Department, 2000; U.S. Bureau of Economic Analysis, 2002



Photo courtesy of Bureau of Land Management

## Commodity and Non-Commodity Production and Use Trends

**On-line Technical Report:**  
[http://frap.cdf.ca.gov/assessment2003/Chapter6\\_Socioeconomic/economicconditions.html](http://frap.cdf.ca.gov/assessment2003/Chapter6_Socioeconomic/economicconditions.html)

**Data Quality: Partial data** ⓘ

The status of resource use and production help identify demands on forests and rangelands as well as economic benefits to consumers. A better understanding of forest and rangeland industries and resources aids decision making on appropriate resource uses to support sustainability.

Several themes are germane to the status and trends of production and use within forest and rangeland regions:

- the regional economies of areas dominated by forests and rangelands are small compared to the overall statewide economy. They have proportionally less high value industries and high wage employment and proportionally more dependence on commodities and services related to forests and rangelands;
- forest and rangeland products are a significant component of regional agricultural economies in some parts of California but small components at a statewide level; and
- as consumers, Californians use vast amounts of commodities such as wood products, water, and range-fed animals. They also use traditional services like outdoor recreation and value ecosystem services such as clean water, wildlife habitats, biological resources, and open space. Many of these can and do come from California's forests and rangelands.

Californians, as consumers, have significant and increasing demands for commodities and services that come from forests and rangelands. Historically, California has met a considerable portion of these demands from its forests and rangelands. Numerous commodity production trends declined during the 1990s in part due to increased demand for other services such as higher water quality, wildlife habitats, and ecological reserves. As the demand for commodities such as timber and paper products has increased with growth in population and wealth, the increasing gap between California production and consumption has been met through imports. For example, California imports approximately three-quarters of its wood and paper products. Imports of livestock, beef, lamb, and related goods are also substantial.

New market and institutional linkages are emerging that connect forest and rangeland products to sustainable guidelines covering economic, ecological, and equity factors. Examples are approaches like the "Buy California" initiative for agricultural products and certification of forests managed under the Forest Stewardship Council or the Sustainable Forest Initiative (SFI).

The natural resources provided by forests and rangelands provide both economic and non-economic benefits to California. The demand, consumption, supply, and constraints on these resources are shown in Table 39.

**Table 39. Production and use trends of selected traditional commodity and ecosystem services in forests and rangelands**

Resource	Level of consumption	Supply/availability	Constraints	Opportunities
<b>Traditional commodities and services</b>				
Forest products: timber	Increasing	Decreasing availability due to new regulations, lawsuits, and increased costs.	Global competition, development, limits on public timber, T&E species, clean water laws, and tax policies	Long-term plans to lower regulatory costs, new products and niche markets. Certification for sustainable forest management, new technologies, income from complementary products and services
Forest products: energy (biomass)	Increasing	Decreasing but could rise	Initial infrastructure costs, energy pricing policies, high planning and regulatory costs, consistent policy integrating energy, fire, forest management, air quality, and water quality	Improved pricing and policies for renewables, enhanced private investment, and new technologies and products
Agriculture: range livestock	Per capita static; total consumption up	Historically cyclical	Development, exotic species, limits on public forage, water availability, T&E species, clean water laws, tax policies, and global competition	Improved range management, consolidation, diversification, improved tax/public policies, and new products and niche markets
Recreation	Increasing but uneven among recreation sectors, slightly increasing toward developed sites and wider range of experiences near urban areas	Uneven by recreation sector, quality of some experiences degraded, new experiences emerging, limited access makes some experiences unavailable	Low public funding, maintenance backlog, liability concerns, transport cost and congestion, and environmental impacts of "overuse" of existing sites	Additional funding, new technologies, new products/"experience" sets, more use of private providers and partnerships, and improved access
Resource-based activities in urban areas	Increasing	Increasing where public or private funding is available	Financing, commercial scale facilities, cost competitiveness, regulatory oversight, technology maturity	Landfill mitigation using organics for energy products
Water quantity	Increasing, especially for human and unique water-based habitats	Limited quantity with current shortage growing to 2020.	Weather, infrastructure, institutions related to pricing and ground water replacement, and T&E and water quality laws	Conservation, new technologies and products, improved pricing and demand management, and new storage
Wildlife as a commodity	Increasing, varies by game species	Uneven, varies by game species	Habitat and population dynamics, past land use legacies	Improved habitat, increased private ventures, and new breeding technology
<b>Ecosystem services</b>				
Air quality	Increasing	Limited, improving selectively	Funding, interbasin transport, global climate change, wildfires, continued development and auto use	Improved technology, use of methods less harmful to air quality, new institutions for pollution offsets, trading, and dealing with interbasin transport
Carbon sequestration	Increasing where cost is less than CO <sub>2</sub> production limits	Increasing	Accounting systems and markets just being developed, existing part of carbon load	Development of accounting and market structure to reimburse sequestration
Water quality	Increasing	Limited, improving selectively	Regulations, past land use impacts, limited restoration funds, lack of sizeable and equitable funding mechanisms	Regulatory change, new technology, increased funding for restoration, and improved information
Habitat restoration—fish	Increasing	Increasing	Funding, exotic species, water availability to moderate flows, continued habitat loss, weather patterns, adequate information to support decision making	Successful habitat restoration and management; new technologies; and new institutions for cost sharing/incentives with private landowners; better monitoring protocols being developed; increased funding via water bond initiatives
Habitat restoration—wildlife	Increasing	Limited	Available funding, exotic species impacts, urban development, habitat loss and fragmentation, limited information, and wildfire	Increased funding, improved information and management, new technologies, policy changes to enhance landowner cooperation
Urban forests/open space	Increasing in communities	Limited, high conversion pressure	Funding and available land base, institutional responsibility for long term maintenance	Increased funding, development of new community/non-profit based institutions
Wilderness allocation	Increasing	May increase with recovery of human-impacted areas; may increase or decrease as social concepts of wilderness change	Conflicts with current land uses, lack of management of threats such as exotics, severe fire, etc. May require Congressional action	Increased public and private funding and new institutions
Ecological reserves	Increasing	Limited	Complexity of identifying effective expansion priorities. Cost of acquiring new parcels, exotics, climate change	Increased public and private funding and new institutions



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## Water Quantity and Use

**On-line Technical Report:**  
[http://frap.cdf.ca.gov/assessment2003/Chapter6\\_Socioeconomic/water.html](http://frap.cdf.ca.gov/assessment2003/Chapter6_Socioeconomic/water.html)

**Data Quality: All Necessary Data Available** ●

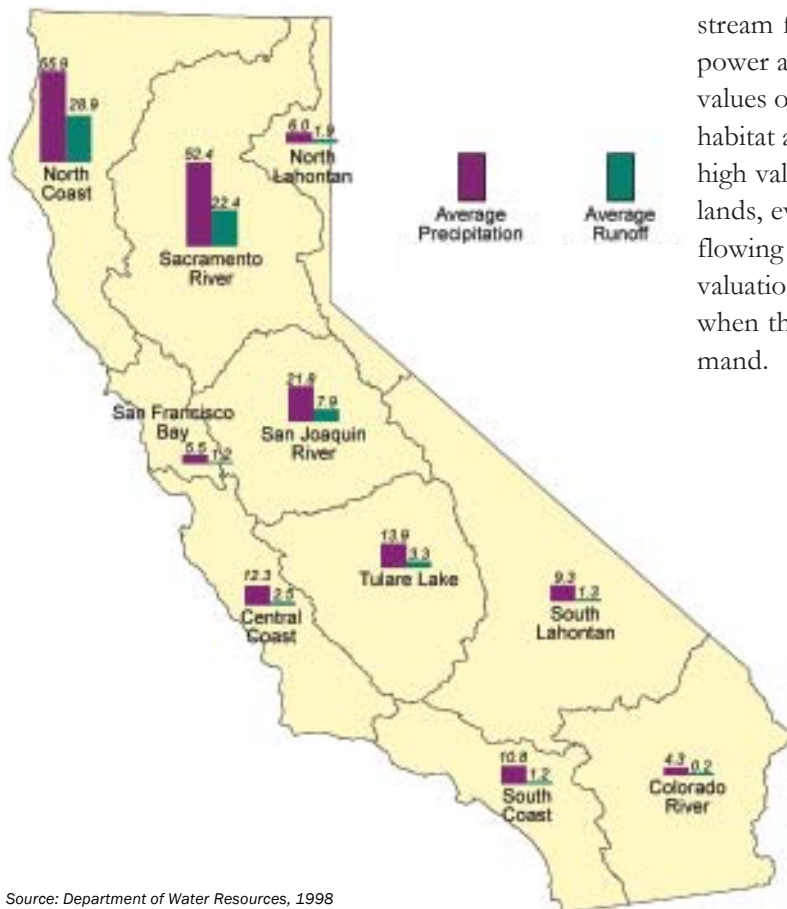
Water remains the State's most important, valuable, and controversial resource. The importance of water to the State has many reasons: 1) water is an essential, non-substitutable commodity needed for human uses; 2) usable water is a scarce resource in many parts of the State; 3) water deficiencies (droughts) and excesses (floods) are recurring problems to the State; 4) water represents the State's most economically valuable natural resource; and 5) water is essential for ecological functions.

Most of the headwaters of the State's streams and rivers are found within forested landscapes. Their associated vegetation and soils are valuable for absorbing snowmelt and rain, storing moisture, providing shade to cool water temperatures and helping hold hillslopes in place. In return, Californians receive quality drinking water, recharged aquifers, reduced flooding, water recreation, habitat for fish and wildlife, and scenic beauty.

In California, more than 70 percent of the State's average annual runoff comes from the northern part of the State above Sacramento, where rainfall and forest cover are greater than in the southern half (Figure 75). National forest lands represent 20 percent of the State's land area but contribute about 45 percent of the total runoff, or 33 million acre feet per year. National forests also provide 9.5 million acre feet for off-stream use (e.g., diverted into irrigation canals and municipal storage) (U. S. Forest Service, 2000).

The Forest Service estimates that the annual value of water from its lands in California at almost one billion dollars, based on values of withdrawal to off-stream use at \$40 per acre foot. Forest Service values for in-stream flow are \$17 per acre foot (e.g., hydroelectric power and recreation). These values do not include the values of waste dilution, channel maintenance, aquatic habitat and wetland functions. This estimate shows the high value and relative importance of national forest lands, even though it understates the true value of water flowing from them. However, as in the case of all water valuations, highest monetary values are only obtained when they are delivered on a schedule of need and demand.

**Figure 75. Average annual precipitation and runoff (million acre-feet per year)**



Source: Department of Water Resources, 1998

Water use is classified as being for urban, agricultural, and environmental purposes in California. Over 79.5 million acre feet of water were used in California in 1995. When in-stream and wetland uses are accounted for, the largest use is for environmental purposes (Table 40). Environmental water represents quantifiable water dedicated to this use by legislative or regulatory processes. It is considered the sum of dedicated flows in state and federal wild and scenic rivers, in-stream flow requirements, required outflows to the Bay-Delta, and applied water demands of managed freshwater wildlife areas.

Over the next decade, regulatory controls for water uses are expected to increase. Controls such as CALFED's Bay-Delta operations, Federal Energy Regulation Commission re-licensing of power facilities, Endangered Species Act, Colorado River usage concerns, and recent California ballot initiatives all lead to increased demands for environmental water uses. Ecological uses of water also represent a mandatory allocation of water, even in drought years. This means that ecological uses are met first, often at the expense of other urban or agricultural uses.

According to the Department of Water Resources (1998), the supply of water was insufficient to meet demand for water in 1995 and is projected to be insufficient through 2020, especially during a drought year. Statewide, the imbalance is exacerbated by population growth, with the State's population expected to grow from 32.1 million in 1995 to 47.5 million in 2020, an increase of over 15 percent. Agricultural water use is ex-

pected to decline due to the conversion of farmland to urban use (Table 40).

Water for urban uses represents the largest expected increase (rate and total quantity) by 2020. Urban uses represent 97 percent of the expected increased demand for water by 2020. Population growth is expected to drive increased water demand for urban uses.

The *California Water Plan* (Department of Water Resources, 1998) identifies the many efforts being attempted to better balance water use and supply. As noted above, the future water supply reliability is in doubt for average water years but especially during drought years (Table 41). Imbalances also vary from region to region within the State, with areas of rapid population growth showing the greatest need. The strategy to address the imbalance involves both demand reduction as well as water supply augmentation options.

Specific strategies involve developing additional surface storage facilities, exploring conjunctive use of groundwater storage areas, water recycling, and desalting, water marketing, and weather modification. Water marketing is the process of buying, leasing, or selling water or water rights to gain access to a water supply. California has no formal water market, but there are a number of major efforts to improve the effectiveness of water markets. Some types of vegetation management can increase water runoff yields but there is still little evidence that significant changes can be achieved on river basin scales without major environmental impacts.

**Table 40. Applied water use in average water year conditions, 1995 and 2020 (million acre-feet)**

Water use	1995	2020 (projected)	Change
Urban	8.8 (11%)	12.0 (15%)	+3.2 (+4%)
Agricultural	33.8 (43%)	31.5 (39%)	- 2.3 (-4%)
Environmental	36.9 (46%)	37.0 (46%)	+0.1 (0%)
Total	79.5	80.5	+1.0

Source: Department of Water Resources, 1998

**Table 41. Statewide water budget for year 2020 with existing facilities and programs (million acre-feet)**

	2020 – average water year	2020 – drought water year
Water use	80.5	66.0
Water supplies		
Surface water	65.0	43.4
Groundwater	12.7	16.0
Recycled and desalted	0.4	0.4
Total	78.1	59.8
Balance	-2.4	-6.2

Source: Department of Water Resources, 1998

## Status of Forest Products Industry

**On-line Technical Report:**  
[http://frap.cdf.ca.gov/assessment2003/Chapter6\\_Socioeconomic/forestindustry.html](http://frap.cdf.ca.gov/assessment2003/Chapter6_Socioeconomic/forestindustry.html)

**Data Quality: All required data** ●

The forest products industry in California is composed of several sectors. These include forestry and logging, basic wood products manufacturing, value-added wood products manufacturing, and paper manufacturing. Both the lumber and wood products industry and the paper and allied products industry, as a percentage of total California Gross State Product, have declined steadily since 1980 (Figure 76). This reflects the growing diversification and growth of California's economy.

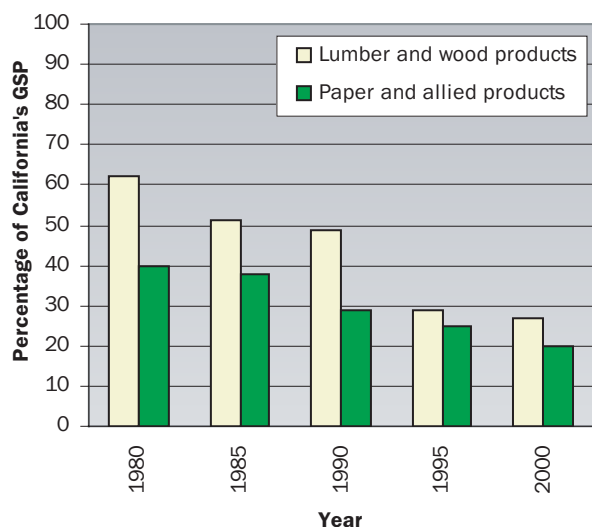
Total consumption of lumber dropped during the recession of the early 1990s, and has increased since then. The future consumption of lumber, in large part, depends on the demand for housing in California, including renovation and remodeling, and is projected to increase. Consumption of paper in California has been much more stable over the last three decades, with a

steady upward trend that already includes a fairly high rate of paper recycling.

Lumber production in California reached a low in 2001 of just over 2.7 billion board feet with an approximate wholesale value of \$1.1 billion dollars (Figure 77). This is the lowest year in the last two decades, continuing to follow an overall downward trend both in number of sawmills and lumber output.

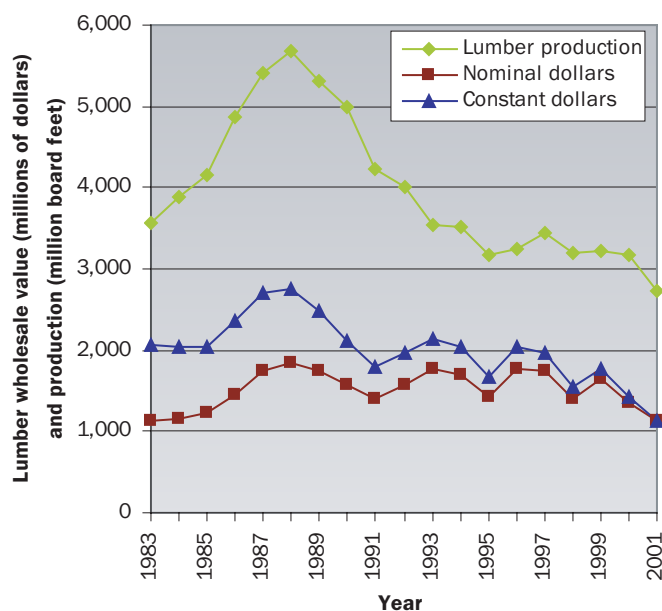
To meet the growing demand for lumber and other forest products, a demand that is equivalent to over 10 billion board feet of lumber, paper, and other wood products annually, Californians rely heavily on imports. Estimates of wood product inflows from other states into California indicate at least three billion board feet of lumber was imported from other western states (Western Wood Products Association, 2002). In 2002, Oregon was California's single largest supplier of lumber. Additional lumber was also imported from Canada as well as other countries and southern states. In addition, California imports nearly all of its pulp and paper.

**Figure 76. Lumber, wood, paper, and allied products Gross State Product as a percentage of total California Gross State Product, 1980-2000 (1996 constant dollars)**



Source: U.S. Department of Commerce, 2002

**Figure 77. Lumber production and wholesale value in current and 1990 constant dollars, 1983-2001**



Source: Western Wood Products Association, 2002

California will continue to rely on wood imports in the future. This is made even more likely because substantial supplies of wood are reaching maturity from investments in timber plantations in foreign countries while public concerns over in-state timber harvesting are continuing.

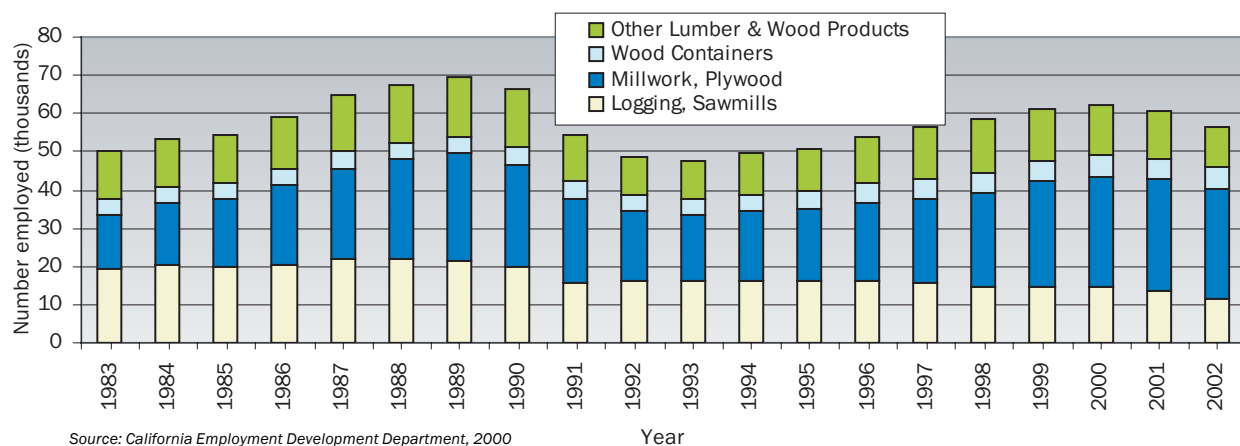
Employment levels provide a measure of the importance of the industry to the rural socio-economic system and the dependency of communities on these industries. Statewide employment trends from 1983 to 2002 in the Wood Products Sector (Standard Industry Classification 24) are shown in Figure 78. Statewide employment peaked in 1989–90 and bottomed out in 1993–94.

The total employment in the wood products industry fluctuates with the overall economic cycle. In addition to improvements in labor productivity, total employment has been strongly influenced by the expansion in the output of value-added wood products.

As lumber production declined, the wood remanufacturing industry has become the major employer of timber-related workers in California. These jobs are typically located in urban areas far from forests and rangelands. Within California, production of wood products other than logging and sawmills is located mostly in southern California. Much of the employment in this sector is located in five counties—Los Angeles, Orange, Riverside, San Bernardino, and San Diego (Figure 79).

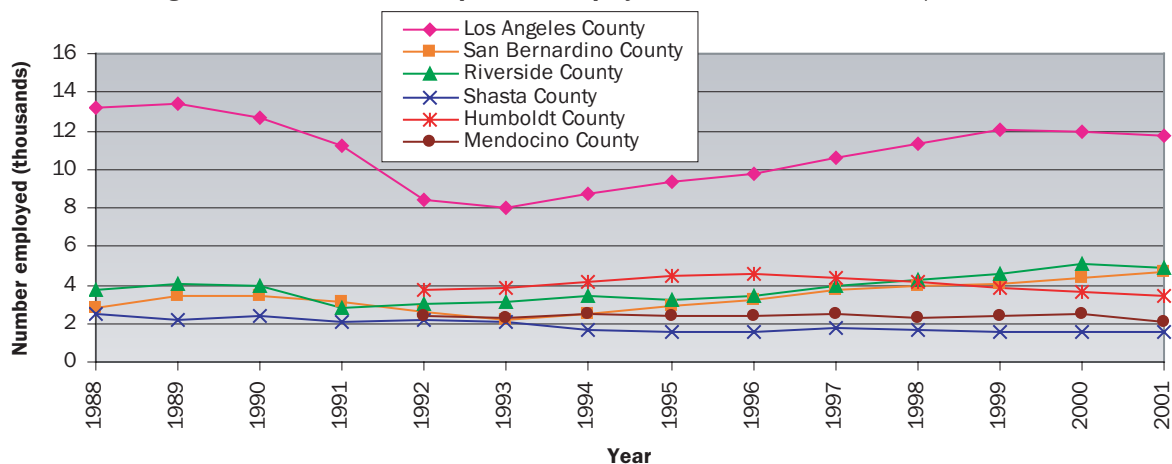
The forest products industry is still the single largest employer in several counties. Yet, local economic significance of the forest products industry has declined as most local economies have diversified and other sources of income such as transfer payments have grown (Table 42).

**Figure 78. Lumber and wood products employment by subsector of Standard Industry Classification 24, statewide**





**Figure 79. Lumber and wood products employment for selected counties, 1988–2001**



Source: California Employment Development Department, 2000

**Table 42. Percentage of total civilian workforce in wood products employment and percentage of personal income from transfer payments for selected counties**

County	Wood products employment (%)			Transfer payments (%), 2000
	1992	1996	2001	
Tehama	5.4	6.2	5.9	23
Humboldt	6.3	7.6	5.8	20
Mendocino	5.9	5.7	4.7	19
Siskiyou	4.1	4.7	4.0	25
Yuba	2.2	2.9	2.8	28
Shasta	3.0	2.2	2.1	21
Amador	5.4	4.1	1.4	18
Del Norte	3.1	2.0	1.3	27
Placer	1.0	0.8	0.9	9
Butte	1.0	0.7	0.8	21
El Dorado	1.2	0.8	0.7	11
Riverside	0.5	0.6	0.7	14
San Bernardino	0.4	0.5	0.6	15
Calaveras	0.7	0.5	0.3	21
Los Angeles	0.2	0.2	0.2	13
Statewide	0.3	0.3	0.3	11
Statewide non-metropolitan				19
Statewide metropolitan				11

Source: California Employment Development Department, 2000

## Status of Range Livestock Industry

**On-line Technical Report:**  
[http://frap.cdf.ca.gov/assessment2003/Chapter6\\_Socioeconomic/rangelivestock.html](http://frap.cdf.ca.gov/assessment2003/Chapter6_Socioeconomic/rangelivestock.html)  
**Data Quality: All required data** ●

Livestock production, primarily cattle and sheep foraging on forests and rangelands, has been the dominant renewable resource use on California's hardwood, shrub, grassland and desert lands for decades. Cattle and sheep convert forage from lands that are generally too dry, steep, rocky, or otherwise unsuitable for crop production into high quality meat protein, leather, wool, and a variety of other products. The livestock industry in California not only creates economic benefits to the forest and rangeland communities, but also supports substantial ecosystem services such as recreation opportunities and preservation of open rangeland that provides wildlife habitat, healthy watersheds, and open space.

Several factors affect the range livestock industry.

- changes in consumption patterns in beef and sheep products, reliance on imports, and increased international competition in livestock and meat production;
- lower prices and higher costs constraining profits;
- consolidation in the market and processing structure of the United States livestock industry;
- increasing emphasis to provide and protect a broad array of environmental values;
- land development pressures that raise the value of rangeland over its worth for livestock operations; and
- the evolution of ways to reimburse ranchers for environmental services, such as through conservation easements.

Consumers in America are eating more chicken, turkey, and fish, and buying less red meat (U. S. International Trade Commission, 1999). Until the late 1990s, per capita beef consumption had been declining, but is now increasing. Based largely on increases in population growth, total consumption of beef in California is projected to increase in the next decade (National Cattlemen's Beef Association, 2002).

American livestock producers, including those in California, have higher land, labor, and other costs of production than do producers in many other countries. Retail prices for red meat are also strongly influenced by worldwide supplies of cattle, sheep and related meat products. Overall, the trend in prices for producers of cattle products declined in the 1990s. This was accentuated in recent years when the U. S. dollar was strong relative to the currencies of other beef and sheep exporting countries such as Australia and New Zealand. The net effect has been that the profit margins of livestock producers have been squeezed by depressed market prices and higher feed costs.

To increase profits, California's cattle industry has focused on increased marketing activities since the production side of the industry is already highly efficient. The California Cattlemen's Association and University of California Cooperative Extension (UCCE) livestock advisors in county offices collaborate in this effort.

There is a substantial movement of cattle into and out of California. Because of abundant grassland, it is common for operators to purchase cattle from outside California, ship them to California to forage on winter and spring grass, and send them out of state for finishing and processing. In 2001, approximately 400,000 head of cattle were brought into California with an estimated 60 percent going to winter pasture and the remainder to feedlots.

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Although it is a net exporter of calves, California still has a feedlot presence. While small in comparison to Kansas, Nebraska, and Texas, in 2000 and 2001, California had the fifth highest number of cattle and calves in feedlots with over 1,000 head capacity in the United States, with well over half in Imperial County. However, the number of cattle marketed from feedlots has fallen consistently since the mid-1980s to below 600,000 animals per year from 1993–1999.

Most meat processing plants are located outside California, especially in the Midwest. This is because feed lots are located outside the State where feed and other costs are lower. The emphasis is on “boxed-beef” technology where carcasses are butchered into individual cuts and then packed and shipped from the slaughtering plant. This approach is capital intensive and has significant economies of scale. Large amounts of boxed-beef are shipped back into California.

Sales of beef cattle account for over 90 percent of the income generated from livestock operations on forests and rangelands (beef cattle farms excluding feed-

lots). Statewide, the real value of cattle sold from these farms declined 23 percent between 1982 and 1997 (NASS, 2001). In 2001, based on production value, cattle and calves were the leading agricultural commodity in nine counties—Calaveras, Imperial, Mariposa, Nevada, Plumas, Shasta, Sierra, Trinity, and Tuolumne.

Approximately 1.4 million cattle were sold from beef cattle farms excluding feedlots in 1997. Regionally, the greatest number of cattle have been sold from the two San Joaquin Valley regions and South Coast/Mojave/Colorado Desert (Figures 80 and 81).

Statewide sheep production has declined over the last decade. In 1999, the statewide value was \$58 million. Top California counties for sheep production are Kern, Solano, Imperial, Fresno, and Merced. While each of these counties contains open rangeland, a large portion of their contribution comes from production in feedlots.

The profile of the structure of California’s rangeland beef cattle industry shows several key characteristics:

- cattle inventories cycle every eight to 12 years based on the biological nature of cattle production and how producers react to market prices;
- most of the inventory of animals is on large farms;
- smaller farms are an important part of the industry but their total production is much less than larger ownerships; and
- inventory is higher in the central and southern portions of California.

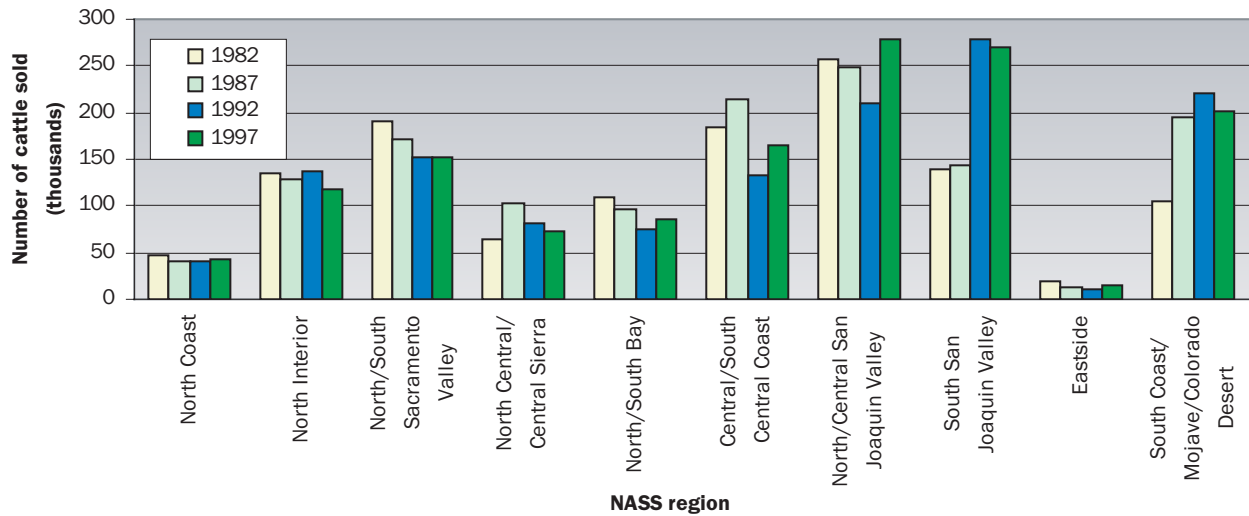
Cattle inventory on all farm types in California has ranged from about 4.5 million head in 1996 to 5.1 million head in 2000. Cattle inventory on beef cattle farms excluding feedlots remained stable between 1992 and 1997 with 1.9 million head of cattle and increased to over two million head by 2002.

**Figure 80. National Agricultural Statistics Service (NASS) regions**



Source: Compiled by FRAP from National Agricultural Statistics Service, 2001

**Figure 81. Number of cattle sold from beef cattle farms excluding feedlots, 1982–1997**



Source: National Agricultural Statistics Service, 2001



Photo courtesy of Gary Cramer, USDA Natural Resources Conservation Service.



## 6 Socio-Economic Well Being

Inventories vary by farm size and region, with production normally concentrated in farms 500 acres or more in size. Since 1982, the inventory has been spread across fewer farms. The Eastside, North Interior, and Central/South Central Coast had a high proportion of their inventories on farms greater than 500 acres. In contrast, South San Joaquin Valley and South Coast/Mojave/Colorado Desert had a relatively smaller proportion of their inventories on farms greater than 500 acres (Figure 82).

Smaller cattle farms (less than 500 acres) provide approximately 25 percent of the range livestock industry cattle inventory. This class of small farms is characterized by having many owners, lower production levels, and goals different than large farm owners. On the smallest farms (one to 49 acres), these lands often reflect management goals such as hobby livestock interests and use of land for “ranchette” residences. These farms often have very complex management issues and are subject to land development pressures.

Continuing urban pressure may drive land use conversions even when ranch owners would prefer to continue existing operations. A recent survey in Contra Costa, Alameda, and Tehama counties suggests that urban ranchers fear local land use conversions and expect that if their ranch is sold it would be converted to urban land uses. In contrast, most rural ranchers felt less threatened by local land use conversions and wanted their property to be a productive ranch even if sold. Most ranchers enjoyed ranching and its associated family life,

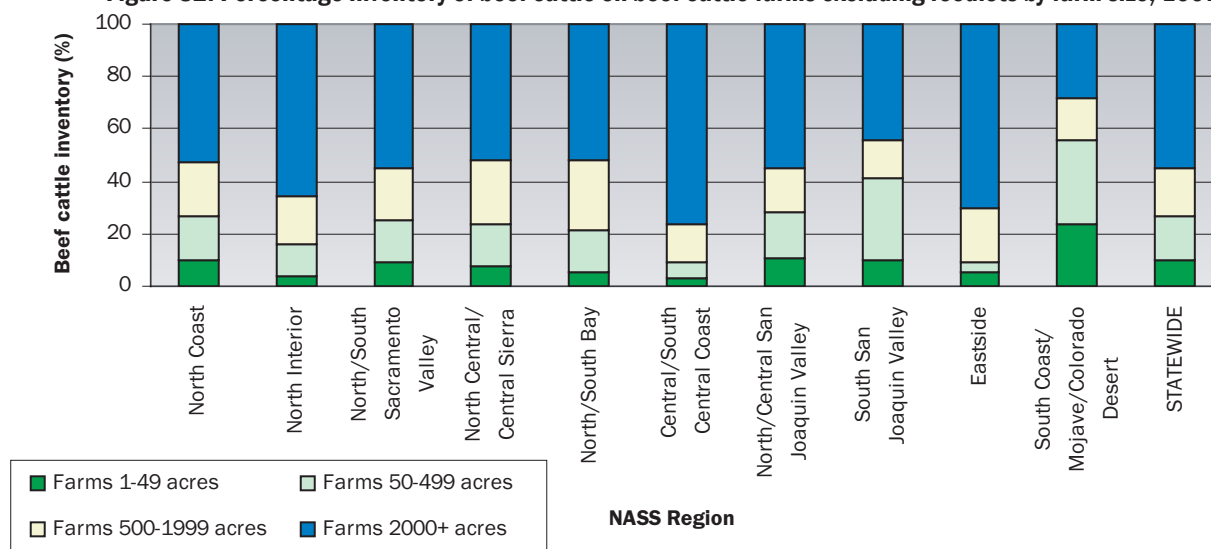
but felt that urban California was becoming more hostile to the livestock industry. In the urban sample, no new ranches had appeared in ten years (Liffman et al., 2000).

With the ranching industry financially constrained, alternate forms of income are critical to keep ranches in operation. This is especially important given key locations of many large ranches currently under development pressure and the desire of ranchers to continue their way of life.

Conservation easements between ranchers and land trusts provide a form of non-ranch income. They typically involve the sale of development or conversion rights and agreement on restrictions or specific land use practices that address escalating regulatory costs. Non-profit land trusts have been expanding in California. There are over 130 land trusts now operating in the State, including the California Rangeland Trust founded by the range community itself. These trusts are funded from a variety of sources, and play a key role in facilitating local conservation easements for ranchers and farmers.

In the opinion of some observers, California’s beef cattle industry is at a crossroads. Many operators are nearing retirement age and may likely exit the industry. The processing sector remains outside of California and market opportunities, especially for smaller producers, are limited. Even in forest and rangeland areas where cattle ranching has been stable in recent years, the business side of ranching will need to remain profitable if the industry and associated land use patterns are to survive.

**Figure 82. Percentage inventory of beef cattle on beef cattle farms excluding feedlots by farm size, 1997**



Source: National Agricultural Statistics Service, 2001

## Status of Forest and Range Energy-Related Industry

**On-line Technical Report:**  
[http://frap.cdf.ca.gov/\\_assessment/Chapter6\\_Socioeconomic/energy.html](http://frap.cdf.ca.gov/_assessment/Chapter6_Socioeconomic/energy.html)

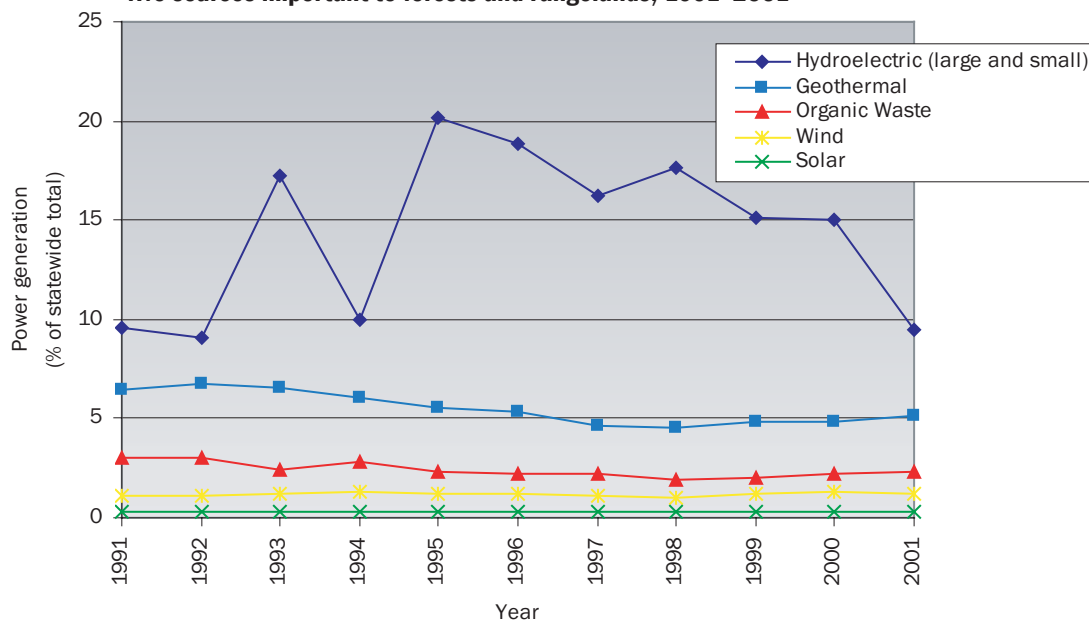
**Data Quality:** All required data ●

Hydroelectric (both large and small), geothermal, biomass, and wind energy generation are related to forest and rangeland resources. Over the last two decades, the relative importance of hydro, wind, biomass, and geothermal energy production has varied, and over the last five years, the relative contribution of hydroelectric has declined (Figure 83).

Extensive investments have been made in California's electricity producing infrastructure. Geothermal, biom-

ass, wind, and waste to energy power plant capacities vary by region. Geothermal and wind resources offer the most immediate potential for increased electrical generation. Biomass also has the potential to expand, but will take substantial investments to realize significant additional output. Largely unutilized sources are forest slash and forest thinnings (Table 43). As of 2002, the California Biomass Energy Alliance reports that its 17 member companies operate 36 biomass-fueled power plants in California. Collectively, capacity is about 720 megawatts of generating capacity at an initial industrial investment of over \$2.5 billion. About two-thirds of these power plants have power purchase agreements through 2006. Most of the other third had agreements only through 2002 and lack longer-term guarantees. Therefore, the sustainability of approximately 20 percent of existing capacity is questionable in the long run.

**Figure 83. Percentage of statewide annual total power generation for five sources important to forests and rangelands, 1991-2001**




Source: California Energy Commission, 2002a

**Table 43. Gross production and current use of biomass on forests and rangelands (million bone dry tons per year)**

Waste source	Gross production	Current use		Excess biomass
		Fuel	Other uses	
Lumber mill	5.5	1.75	3.25	0
Forest slash	4.5	0.25		2.5
Forest thinnings	3.8	0.25		1.4
Chaparral	7.7			0.8
Urban wood	3.2	1.0	0.5	0.7
Urban yard	3.9	0.2	0.5	1.2

Source: California Energy Commission, 2002a

## Status of Recreation Industries

**On-line Technical Report:**  
[http://frap.cdf.ca.gov/assessment2003/Chapter6\\_Socioeconomic/recreation.html](http://frap.cdf.ca.gov/assessment2003/Chapter6_Socioeconomic/recreation.html)  
**Data Quality: partial data** 

Outdoor recreation is an important use for most forests and rangelands, both public and private, in California. In addition to the scenic value of these lands, the variety of outdoor recreational opportunities available on forests and rangelands is a significant component of the quality of life for many Californians and a major attraction for many out-of-state visitors. Providing a succinct summary of outdoor recreation in California is challenging due to the tremendous diversity in nearly every facet of this topic—land ownership, levels of use, types of activities, roles of private service providers, and probable future trends.

Understanding the major trends and characteristics driving recreation in California will help meet the goal of providing recreational opportunities for Californians. Major trends and characteristics include:

- **Population growth:** With the state's population expected to grow from 34 million in 2000 to 45 million by 2020, increases in total use are expected. This is particularly true in California's urban areas where most of the population resides. Other rapidly growing areas include inland areas such as the foothills of the Sierra, the Sacramento and San Joaquin Valleys and inland empire of the southern California such as Riverside and San Bernardino counties.
- **Demographic changes:** Changing age and cultural patterns, including increasing proportion of multi-ethnic Americans and an aging baby boomer population, will drive new demands on recreation resources.
- **Changing patterns of use:** Emerging patterns of use include shorter duration trips and a wider variety of activities such as nature study activities and adventure sports.

## Recreation Use

Table 44 summarizes the areas, visits, and standardized 12-hour recreational visitor days (RVDs) by major providers as well as by the location in relation to metropolitan areas. Approximately 95 percent of the public land available for outdoor recreation is in federal ownership but over 70 percent of the visits occur on state and local government properties. Most local, many state, and some federal properties are located near metropolitan areas (defined as being within an hour drive of one of California's major metropolitan centers). As a group, these metropolitan areas represent around 13 percent of the area available for outdoor recreation but provide 50 percent of all visits.

The pattern of metropolitan area units having much higher per acre use rates (often five to 10 times as high) is consistent across ownership types and vegetation types. Table 45 illustrates use intensity for a range of units from the most intensely used areas (urban beaches) to remote wilderness areas. All trends point to increases in outdoor recreation in metropolitan public areas while use trends for more remote public areas are flat or even declining in some cases. Use rates tend to drop off rapidly as areas become more distant to population centers. The facilities that experience overcrowding, such as picnic areas, campgrounds, and trails, are typically those with high day use and close proximity to metropolitan areas.

The National Park Service (NPS) has 22 major sites across California and collects the most consistent and

**Table 44. Outdoor recreation on forests and rangelands by provider and location, 2002**

	Area available for recreation	Visits*	12-hour RVDs**
Total in millions	45	184	138
	Available area (%)	Visits (%)	12-hour RVDs (%)
Major provider			
State Parks	3	43	31
Regional Parks	1	22	12
National Park Service	16	18	13
U.S. Forest Service	45	6	29
Bureau of Land Management	34	4	9
Location			
Metropolitan areas	13	50	40
Non-metropolitan areas	87	50	60

\* "Visits" refers to a single trip by a person regardless of length of stay.

\*\* "Recreational Visitor Day" is a visit by one person for a 12-hour length of stay.

Sources: FRAP, 2003

accurate use data on both the number of visits and how long each visit lasts. Figure 84 illustrates a flat trend in the number of visits but a 26 percent drop in the average length of stay during the 1990s. While unique factors (temporary and permanent closures due to floods, fire, and landslides) have affected major parks such as Yosemite, the overall trend appears to be one of people making more short visits and fewer multi-day visits. A study for a subset of California State Parks most closely related to forests and rangelands, showed a small increase in use over the decade with most visits occurring near metropolitan areas.

**Table 45. Recreation use intensity for select use areas, 2002 (millions)**

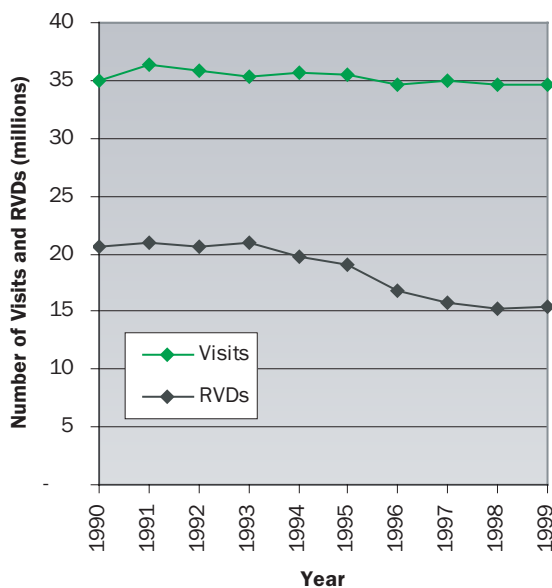
	Area	Visits*	RVDs**	RVDs/ acre
State Parks - Southern California beaches	0.05	28	11	224
Other metropolitan parks	0.77	72	29	37
USFS - metropolitan national forests	3	10	22	4
USFS - rural national forests	11	2	18	1
USFS wilderness	6	0.4	2	0.4

\* "Visits" refers to a single trip by a person regardless of length of stay.

\*\* "Recreational Visitor Day" is a visit by one person for a 12-hour length of stay.

Sources: FRAP, 2003a

**Figure 84. Visits\* and Recreational Visitor Days\*\* on National Park Service parks in forests and rangelands, 1990-1999**



\* "Visits" refers to a single trip by a person regardless of length of stay.

\*\* "Recreational Visitor Day" is a visit by one person for a 12-hour length of stay.

Source: compiled by FRAP from National Park Service, 2001

## Recreation Activity Types

The most popular types of outdoor recreation in California are associated with walking and all forms of trail use, beach visits, sightseeing, and picnicking. In many cases, the vegetation and physical features of forests and rangelands are primarily a backdrop for these activities. The best data on the types of recreational activities more directly dependent on forest and rangeland settings comes from the recent U.S. Forest Service surveys of recreational activities on national forests. Table 46 summarizes the major activities of visitors based on new statistical surveys completed on eight of the 20 national forests in California. The sample covered four national forests adjacent to major metropolitan areas, Los Angeles, San Diego, Sacramento, and Reno, and four national forests far from metropolitan areas. Use patterns were similar across both metropolitan and non-metropolitan forests for all activities except for fishing where the non-metropolitan forests have considerably higher use rates.

**Table 46. Major activities of visitors to eight national forests in California as a percentage of total visits, 2002**

Activity	Percentage of visitors
Viewing	48
General relaxation	43
Hiking/Walking	37
Skiing	24
On road driving	18
Developed camping	14
Fishing	14
Off Highway Vehicles (OHV)	9
Mountain biking	6
Hunting	4
Minor forest products collection	3
Designated wilderness	3

Source: compiled by FRAP from National Visitor Use Monitoring Program, U.S. Forest Service, 2002A



## 6 Socio-Economic Well Being

Use preferences are also evaluated by the California Department of Parks and Recreation (CDPR). In a public opinion poll conducted in 2002 by CDPR, camping, an activity closely associated with forests and rangelands, rated highest among all recreation activities in terms of latent demand and public support. That is, what the public would like to do more and what the public thinks government agencies should fund.

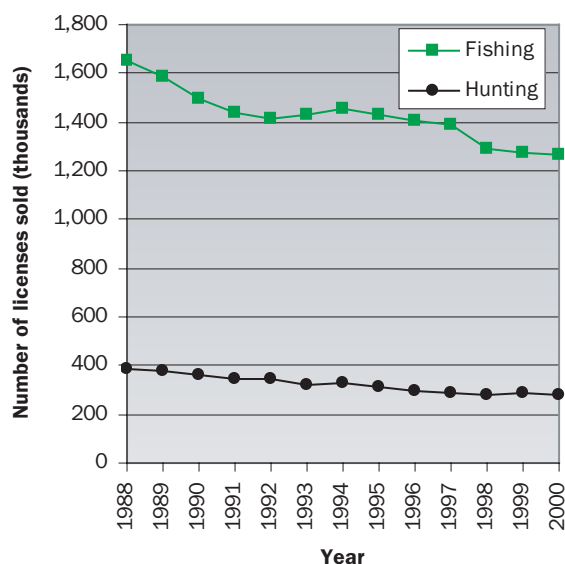
In addition to the decline in the average length of stay, another significant trend has been the decline in the relative importance of fishing and hunting in the overall mix of outdoor recreational activities. Figure 85 illustrates the trends in the number of fishing and hunting licenses sold by the California Department of Fish and Game. While the value of license fees represents a larger portion of total fees paid by users than their numbers of visits suggest, the declining trends illustrate the changing nature and greater mix of outdoor recreational activities in California.

Considerable outdoor recreation also occurs on privately owned forests and rangelands, especially on parcels owned by individuals rather than businesses. Recent surveys suggest that around half of all owners of non-industrial forest and rangeland properties in the Pacific

Coast states (California, Oregon, and Washington) allow their land to be used for recreation by their extended family and friends (Teasley et al., 1999). With over four million acres of non-industrial forest land and an even larger area in small to medium rangeland parcels in California, this represents a significant portion of outdoor recreation.

In addition, much of the outdoor recreation on forests and rangelands occurring on publicly owned lands is often accompanied by recreational services provided by private sector businesses and concessions. The publicly owned land and facilities support both benefits to the user of low-cost or no-cost recreational opportunities as well as significant business and employment opportunities that provide additional value-added services to users. One of the most significant examples of this complementary relationship is the number of private campground sites across the state and in the forest and rangeland regions. As Table 47 illustrates, private campgrounds represent the majority of sites.

**Figure 85. Annual number of fishing and hunting licenses sold by the Department of Fish and Game, 1988–2000**



Source: California Department of Fish and Game, 2001b



Jackson, Amador County

## Economic Impact

Private campgrounds are just one example of the economic contributions of outdoor recreation to California's overall \$64 billion travel spending business in 1998. Approximately \$3 billion was related to camping, \$3 billion to fishing, \$2.3 billion to wildlife viewing, and \$0.8 billion to hunting. In addition, forests and rangelands are an important component of the scenic value of travel to areas such as the Napa Valley and the Tahoe Basin. The overall growth in travel spending in forest and rangeland regions during the 1990s suggests that the economic value of outdoor recreation is increasing faster than the number of visits (Table 48).

## Implications of the status and conditions of wildland recreation

Summarizing the results of the recreation use, supply, and activity preferences provides insight to the future needs of wildland recreation in California.

- Participation rates for most activities associated with forests and rangelands are growing, and

for some quite significantly. With growing population, demand for all wildland recreation will increase in absolute numbers, even though some activities may show stable or declining participation rates.

- Recreation use near metropolitan areas is increasing and many sites are intensely used. Accommodating quality experiences for users while protecting the natural resources will be increasingly challenging.
- More user conflicts are likely to result as the scope of activities expands and user group demands overlap.
- Recreational providers must adapt their facilities to be relevant to the changing user profile.
- Water related recreational sites will continue to have the highest intensities of use and risks of loss of ecological values.
- Coordination between and among public agencies at all levels of government, non-profit land trusts, and private forest and rangeland operators will be needed in the future. Coordination should include strategically acquiring land and easements and providing opportunities in response to recreation demands.

**Table 47. Campsite inventory for selected bioregions and statewide, 1999–2000**

County-based bioregion	Private	City-County	CA State Parks	USFS	NPS	Other federal	Utilities	Total
Bay Area/Delta	4,812	631	1,324	0	0	0	0	6,767
Central Coast	6,709	1,341	3,238	1,262	92	991	0	13,633
Klamath/North Coast	12,822	730	2,360	652	133	484	15	17,196
Modoc	8,071	0	707	4,663	645	144	441	14,671
Sierra	12,738	1,429	1,770	9,762	2,734	1,890	177	30,500
Statewide	91,498	8,692	15,178	19,391	5,668	4,252	633	145,312

Other federal includes BLM (Bureau of Land Management), COE (U.S. Army Corps of Engineers), and BOR (Bureau of Reclamation);  
USFS: USDA Forest Service; NPS: National Park Service  
Sources: compiled by FRAP from Dean Runyan Associates, 2000a

**Table 48. Travel spending and percentage change by selected bioregions and statewide, 1992–1998 (million constant dollars)**

County-based bioregion	1992	1993	1994	1995	1996	1997	1998	Percentage change 1992-1998
Bay Area/Delta	12,005	12,556	13,107	13,819	15,052	16,640	17,779	48
Central Coast	3,714	3,873	3,981	4,021	4,338	4,756	4,873	31
Klamath/North Coast	986	1,055	1,150	1,224	1,274	1,331	1,373	39
Modoc	75	81	88	92	99	103	104	39
Sierra	2,457	2,662	2,852	3,068	3,113	3,356	3,567	45
Statewide	47,543	49,014	50,803	52,548	55,961	61,301	64,424	36

Source: compiled by FRAP from Dean Runyan Associates, 2000b

## Timber and Rangeland Contributions to Funding Rural Infrastructure Needs

**On-line Technical Report:**  
[http://frap.cdf.ca.gov/assessment2003/Chapter6\\_Socioeconomic/contributions.html](http://frap.cdf.ca.gov/assessment2003/Chapter6_Socioeconomic/contributions.html)

**Data Quality: All required data** ●

Provision of adequate infrastructure like roads and programs such as public health are key to economic development and high quality lifestyle. For the most part, statewide discussions over the provision of infrastructure in California have been focused on urban areas. At the same time, the infrastructure needs in California's forest and rangeland counties are significant.

Rural areas are competing as part of California's regional economy and must be able to offer attributes that attract industries and retain workers. Most of these rural economies have traditionally been dependent on agriculture, mining, forestry, and ranching. As these industries have declined, tourism has become more important to local economies. While tourism offers promise, it also brings special infrastructure needs.

Of special concern for social and economic sustainability is the ability to supply infrastructure in California counties with significant forest and rangeland resources. For the most part these counties are rural, meaning they have fewer than 250,000 residents and no single city with more than 50,000 residents, as classified by the U.S. Census. A number of these counties have over 50 percent of their area in forests and rangelands and significant economic output from forest and rangeland activities. Per capita expenditures vary greatly by county and special district. More than half of rural counties have less spending per capita for recreation, soil conservation, library services, sanitation, and water than the State average. In the case of fire protection expenditures provided by special districts, ten rural counties significantly exceed the State average. For the fiscal year ending June 30, 1999, 16 of these forest and rangeland counties were more reliant on taxes and special benefit assessments than the statewide average. Hence, they tend to be more sensitive to changes in the fiscal structures that affect property taxes or special benefit assessments.

In past decades, tax revenue associated with timber harvesting on private and public lands has been a source of significant revenue to many local rural governments in California. Given the growth in California's economy and changes in the funding structure of local government, timber-related revenue has become a progressively smaller percentage of total revenue sources for local governments. Three factors have led to decreased importance of timber-based revenues for counties and school districts: 1) increased availability and reliance on non-timber sources of local revenue; 2) changes in state funding for education that make up for yield tax declines; and 3) federal legislation providing a revenue floor to rural governments formerly dependent on national forest receipts.

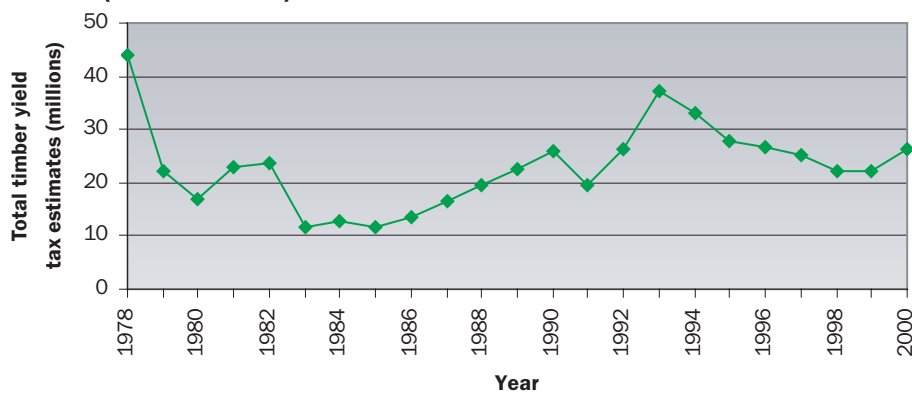
Timber harvested in California is subject to a yield tax, which is a percent tax on the value of timber when it is cut. The yield tax is currently 2.9 percent of assessed timber value at time of harvest. Yield tax differs from an ad valorem tax which annually taxes timber property and standing tree value regardless of when timber is harvested. A small property tax is also levied against private lands zoned for timber production. Over the last two decades, the timber yield tax peaked in 1978 and again in 1993 at well over \$30 million statewide (Figure 86). During the 1990s, the yield tax averaged approximately \$25 million. Based on the average from 1978 to 2000, the counties with the highest yield tax receipts are Humboldt, Mendocino, Siskiyou, Del Norte, Shasta, Trinity, and Plumas.

Historically, revenue from federal lands has come from payments by federal agencies, including in-lieu payments by the Forest Service and the Bureau of Land Management. A large portion of these federal payments come from receipts for timber harvesting on national forests. These payments declined dramatically over the 1990s, as federal timber harvests declined (Figure 87). In response to this trend across the West and other states, federal legislation was enacted (Secure Rural Schools and Community Self Determination Act of 2000 [PL 106-393]) that provides a revenue floor to rural governments formerly dependent on national forest receipts. Since 2002, a steady level for California was set at approximately \$65 million.

Overall, the total annual tax and in-lieu of tax revenues from timberlands in 2000 was approximately \$100 million. This revenue includes \$65 million of in-lieu payments from national forest timberlands, \$26 million from timber yield taxes, \$8 million from timberland property taxes for lands with Timber Production Zone (TPZ) status, and small amounts from Bureau of Land Management and property taxes from timberlands without TPZ designation. Additional funding does come from resources on federal lands, but statewide, total funds amount to less than one percent of all revenue sources to local government.

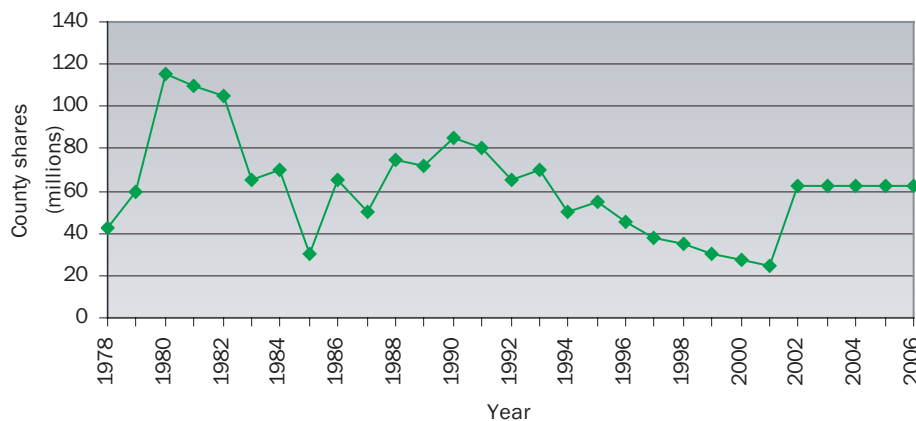
With timber related revenues for local governments constrained, rural economic policy is challenged by the fact that economic growth can be limited by inadequate infrastructure, operating funds, and technical assistance. Over the last decade, Californians especially have been willing to invest in education and programs for open space, parks, habitat, and improved air and water quality. However, at the local level, taxpayers have resisted raising taxes. Combined with the limited ability of local governments to raise funds under the current system of public finance, planning for and provision of local services in some forest and rangeland counties can be difficult.

**Figure 86. Timber yield tax payment estimates from all ownerships, 1978–2000 (nominal dollars)**



Source: California State Board of Equalization, 2000.

**Figure 87. Actual and projected county shares from national forest receipts in California, 1978–2006 (nominal dollars)**



Source: U.S. Forest Service, 1999.